

## Everything Auto

Tom Morr

### Get In Line

Most people think that wheel alignment is best left to the professionals. While this is true in many respects, there are some alignment specs you can check yourself, and toe is one aspect of alignment that can be done at home. This particularly comes in handy after replacing steering or suspension components to make sure the vehicle won't be wildly out of adjustment for the trip to the alignment shop, or at the very least it will provide a better understanding of the alignment process.

#### Theory

Some alignment specs are easy to check yourself. In theory, all four wheels should be perpendicular to the ground and parallel to each other. When the vehicle starts pulling to one side < or after a sharp impact with a curb < most drivers suspect the wheels might be out of alignment. Irregular tire wear, vibration and odd handling characteristics are other clues. The three factors that affect alignment are toe-in, camber and caster. The first two can easily be checked at home.

#### Toe-In

Cars' front tires are slightly pigeon-toed to intentionally place a very slight load on the wheel bearings. Typical toe-in specs vary from 1/32- to 1/8-inch, depending on the vehicle. Check a service manual for your car's acceptable range. The best tip-off to a toe problem is a saw-tooth wear pattern that's equal on both front tires. If the tread blocks point toward the frame, then toe-in is excessive; pointing outward indicates too much toe-out. Toe-in spec-check and adjustment are shown in the accompanying photos. Although no specialized tools are necessary to check toe, companies such as Eastwood, JC Whitney and Harbor Freight sell tools specifically for this purpose. Two things to remember when measuring and adjusting toe: First, true spec is measured midway up the tires. If the car's body makes this impractical, take the front and rear measurements 1/4 of the way up the tires, then double that to get the true toe as it would be in the center of the tires. Also, an off-center steering wheel can sometimes be corrected by adjusting one tie-rod more than the other. (Steering wheel position has no affect on your final alignment.)

#### Camber

Camber is easy to check with an angle finder and a straight edge. Camber is the measurement of tire lean in degrees. If the top of the tire tilts inward, the vehicle has negative camber; outward lean is positive camber. Most new vehicles have slightly negative camber to improve stability and handling. Two indicators of camber problems are the vehicle pulling to one side (the one with more of a positive camber or possibly less air in the tire) and uneven tire wear across the tread. Camber is easy to check with an angle finder and a straight edge, ideally one that's the same length as the wheel diameter so the tire sidewall bulge doesn't interfere with the straight edge. Many front-wheel-drive cars don't have camber adjustments, and out-of-spec camber here often indicates bent or worn parts. On vehicles that have adjustable camber, the job can involve adding shims between the control arms and frame and turning cam bolts. Many people prefer to let an alignment shop make these adjustments, particularly if their car has independent rear suspension.

#### Caster

Caster is the angle of steering pivot in degrees. Just as water skiers lean backward for stability, most vehicles are designed with slight negative caster the upper balljoint is to the rear of the lower balljoint (similar to the front wheels on a shopping cart). One clue to caster problems is that the vehicle pulls to one

side (the one with less of a positive caster). Heavy steering and wheel hopping over bumps are signs of too much positive caster, and light steering but excessive wander are clues of too much negative caster. Aligning-to-spec usually involves repairing or replacing chassis parts, so the average motorist is probably better off leaving caster corrections to the pros. Taking a few minutes to check your alignment will make your tires last longer and your vehicle handle better. Even if you choose to have a shop align the vehicle you'll have a better idea of the problem and knowledge equals power.

#### Resources

Eastwood Co., [www.eastwoodcompany.com](http://www.eastwoodcompany.com)

Harbor Freight Tools, [www.harborfreight.com](http://www.harborfreight.com)

Hunter Engineering, [www.hunter.com](http://www.hunter.com)

JC Whitney, [www.jcwhitney.com](http://www.jcwhitney.com)

Close Window